

## **EXHIBIT "A" (Scope of Work)**

### ***Data Collection***

- Collect traffic data
- Develop data collection requirements including identification of specific data fields; perform field inventories of traffic control devices, ITS infrastructure including fiber optic communications.
- Assist in warehousing and managing the data
- Perform the collection of railroad crossing physical information - may include photos and reports

### ***Studies / Analysis***

- Perform traffic studies or analyses. Analyze various types of transportation data - crash, operations, roadway characteristics, summarize, and visualize in various formats for public use and understanding in decision-making.
- Perform field studies, such as speed, curve, signing, operation, and safety.
- Perform Access Management studies and analyses, including but not limited to preparing traffic impact studies as well as the review of major and minor traffic impact studies from developers and other consultants. Provide technical support.
- Perform corridor signal timing progression plans, optimization plans, including ramp metering studies.
- Conduct accident analyses needed for consideration of safety measures in the designs and planning of transportation projects. Accident history will be provided by CDOT in most cases.
- Provide Geotechnical recommendations and reports with regard to test hole boring, classifications analyses, concrete and asphalt testing.
- Conduct traffic engineering, TSMO, safety, and operations support work for region and headquarters staff. Work may include conducting inventories, polls, survey, research, literature review, summaries, compilation, program evaluations and audits, technical, policy, procedural writing.

### ***Design***

- Design and Prepare preliminary and final plans and specifications for all types of Traffic, TSMO, MLOS and ITS Projects to meet CDOT, City, or County requirements, including but not limited to:
  - traffic signals (LED displays, mast arm designs, etc)
  - vehicle detection system (video, loop microwave, radar, ultrasonic, etc)
  - interconnect systems (hardware, phone, cellular phone, spread spectrum, radio etc)
  - pavement markings (tape, thermoplastic water based etc)
  - sign and sign support systems (wood, metal and composite systems)
  - and other intelligent transportation systems devices (variable message boards, closed circuit television, fiber optics and other communications media etc)
  - intersection designs
  - engineering of sign sequences on the highway or approaching each highway
  - sign layouts
  - roadway re-striping and roadway design
  - calculate quantities and estimates for plans
  - Fiber Optic Networking Drawings and Fiber Optics Splicing Plans

- ITS Fiber Network plans for interconnection to the Colorado Traffic Management Center (CTMC), Nodes/Regions, tunnels, EJMT, HLT, and Traffic management centers
- ITS Network Support Plans
- Furnish detailing and drafting services.
- Perform traffic control management and coordination activities for construction and other projects
- Construction management, inspection and completion of appropriate CDOT paperwork as required, including ITS construction and field management
- Develop plans and specifications for CDOT ITS and telecommunications related projects or tasks. This includes, but is not limited to developing network design, fiber assignments, studies and reports.

#### ***Review and Technical Support***

- Local Agency project plan review and structural review. Comments and recommendations as needed.
- Review, attend meetings and provide technical assistance on traffic impact studies, NEPA, 1601's, Interchange Access Request (IAR), Environmental Assessments and Environmental Impact Studies as requested.
- Attend meetings as instructed. Prepare visual aids for meetings, as needed. Take minutes and prepare reports, as needed.
- Provide technical assistance with traffic engineering, TSMO, and ITS issues as requested and create white paper write-ups.
- Provide technical support in the area of planning, design, operations, maintenance and integration of Toll roads and managed lanes.
- Prepare letters of correspondence and meeting minutes.
- Provide expert testimony regarding traffic operations.
- Review and/or designs structural shop drawings for Traffic signals, ITS structures (cantilevers, butterfly, two posts, bridge attachments for conduit, light poles and others as requested). Provide a Professional Engineers (PE) Stamp from Colorado to certify designs and/or changes to designs.
- Provide miscellaneous services regarding traffic operations and ITS to help with the Region's and the CTMC's day to day operations.
- Provide staff as needed to compliment the Region operations offices in all capacities.
- Provide Assistance with Statewide planning, agreements, and public or private coordination activities for current and future ITS, traffic, congestion management, and other CDOT activities.
- Conduct program or project management oversight, coordination and facilitation activities and assistance for region and headquarters staff to deliver safety, traffic engineering, and operations programs. Such work might include: assisting staff in organizing outreach meetings with local agencies, developing application submittal, review, development of contract or procurement documents, and award process for local agencies to use CDOT or federal funding.
- Collect, review, process, and perform Quality Control/Quality Assurance traffic or safety data
- Assist staff with developing, integrating, and reporting safety, TSMO, traffic engineering, and operations performance measures, metrics, and KPI's
- Conduct Modeling, Simulation, Analysis and alternatives analysis for various roadway segment and intersection configurations for traffic engineering, operations, and safety scenarios using current modeling software including but not limited to VISSIM, CORSIM, SYNCHRO, Rodel, Dynus-T, HCS.

### ***Construction***

- Prepare construction signing plans and schedules. Develop conceptual phased construction plans considering geometric design, capacity analysis, construction signing, temporary guide signing, temporary pavement markings and temporary signal design.
- Construction management, inspection and completion of appropriate CDOT paperwork as required, including ITS construction and field management
- Perform construction traffic control management and coordination activities.

### ***Training***

- Perform, review, train and provide technical support on various travel demand and traffic operations models including, but not limited to VISSIM, CORSIM, SYNCHRO, and Dynus-T.
- Train CDOT personnel on use of specialized traffic, transportation engineering and telecommunications related software in addition to any training requested.
- Provide multi-user multi scenario simulation training programs. This includes trainings, such as ICS and TIMS readiness, software, program, and process training.

### ***Field Data, Surveying, Inspection and Locates***

- Provide underground fiber optic, power cable, and all other utility locating services for Traffic and ITS communications backbone and devices :
  - Attend field locate meets at the appointed time.
  - Mark underground utilities with appropriate markings and color.
  - Respond to emergency locate requests within a 4 hour time period.
  - Provide a sketch or as-built drawing to the contractor when requested.
- Provide structural inspection and report of Traffic Signal poles and mast arms, ITS structures and sign structures.
- Roadway surveying with a PLS Stamp as required, traffic control and permits will be required.

### ***Signing and Marking***

- Prepare freeway guide signing plans consistent with MUTCD and CDOT's practices and policies. Prepare sign bridge plans, MLOS sign plans and sign layouts using current CDOT programs.
- Perform pavement marking retroreflectivity measurement activities

### ***Manuals, Procedures, and Guidance***

- Prepare and update Traffic Incident Management Plans as requested. This includes development of actual plans or strategies, manuals, training and meeting documents. Conduct quick clearance training. Table top exercises, functional exercises and create other documents as required.
- Support and assist with the implementation of Incident Management Plans and other operations strategies and programs along with related trainings and briefings.
- Prepare and update Lane Closure Strategies as requested. This includes development of actual plans or strategies, manuals, training and meeting documents.
- Prepare TSM&O reports as needed.

### ***Procurement***

- Assist CDOT in procuring specialized related data, hardware, software and training.
- Provide oversight and assistance in procurement programs, such as sponsorship programs for the procurement of equipment and services

### ***TSM&O Support***

- Conduct before/after studies to evaluate the TSMO strategies including signal timing and ramp meter operations.
- Develop Region TSMO Plans, corridor operations plan in accordance with the statewide TSMO plan; update the existing statewide ITS architecture in turbo.
- Develop functional requirements for operational performance measures for automated reporting using available CDOT systems and reporting tools.
- Provide support in SAP functions with regards to materials, warehouse, master data, fixed assets, etc.. This included functions for budget and Task Order management.
- Provide support with asset management functions for signals and other ITS devices, signs, marking and fiber optic communications.
- Provide fiber network communications support for CDOT's CISCO and CIENNA networks and assist in migration.
- Assist in the full implementation of operations clearance process including operational assessment creation, study and review. Assist with SEA and Safety processes in SharePoint.
- Assist in explorations and evaluation of emerging technologies includes aerial support for operations, connected vehicles, big data tools, etc.
- Assist in development of bottleneck mitigation program with identification of locations, implementation and evaluation of measures.
- Assist in the development of policies, procedures, guidelines for administration of various engineering programs, which may include:
  - Facilitate meetings, develop agendas, prepare invitations, keep minutes, contribute to discussions
  - With input from CDOT and stakeholders, help develop and write procedures, processes, guideline documents that explain criteria, factors, scoring for selection, prioritization, weighting of safety and operations projects
  - Prepare executive summaries, presentations for use by CDOT staff for executive meetings, management briefings, Commission presentation, etc.
  - Write, edit, and revise technical specifications and standard plans
- Conduct strategic planning for administrating and delivering various engineering programs:
- Assist in developing missions, vision, objectives, goals, measures, road-mapping, schedules, project development.
- Provide the ability to utilize and access external CDOT subject matter experts in various current and emerging programs, projects, software and architectures. These include ITS, operations, planning, safety, managed lane pricing, and traffic operations strategies (such as variable speed limits and incident programs).
- Provide on sight, full or part time, support services.
- Assist with Change Management.